ASRock Rack

OPEN Industry Standard, Flexible Architecture

GREEN Less Heat, Less Power Consumption

STABLE Robust Design, Quality Parts

Stable and
Reliable Solution

Server/Workstation
Motherboard

MT-C224

User Manual

English

Version 1.0

Published August 2014

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Copyright Notice:

Disclaimer:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) this device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.

CALIFORNIA, USA ONLY

ASRock Rack's Website: www.ASRockRack.com

Contents

Chapter 1 Introduction

Thank you for purchasing ASRock Rack **MT-C224** motherboard, a reliable motherboard produced under ASRock Rack's consistently stringent quality control. It delivers excellent performance with robust design conforming to ASRock Rack's commitment to quality and endurance.

In this manual, chapter 1 and 2 contains introduction of the motherboard and step-by-step guide to the hardware installation. Chapter 3 and 4 contains the configuration guide to BIOS setup and information of the Support CD.

> ⚠ *Because the motherboard specifications and the BIOS software might be updated, the content of this manual will be subject to change without notice. In case any modifications of this manual occur, the updated version will be available on ASRock Rack website without further notice. You may find the latest memory and CPU support lists on ASRock Rack website as well. ASRock Rack's Website: www.ASRockRack.com*
>
> *If you require technical support related to this motherboard, please visit our website for specific information about the model you are using.*
> *www.asrock.com/support/index.asp*

1.1 Package Contents

- ASRock Rack MT-C224 Motherboard
  (Extended Mini ITX Form Factor: 7.8-in x 6.7-in, 19.8 cm x 17.0 cm)
- Support CD
- User Manual
- 1 x I/O Shield
- 4 x SATA3 cables (50cm)
- 2 x SATA3 cables (60cm)

> ☆ *If any items are missing or appear damaged, contact your authorized dealer.*

English

Contact Information

If you need to contact ASRock Rack or want to know more about ASRock Rack, you're welcome to visit ASRock Rack's website at www.ASRockRack.com; or you may contact your dealer for further information.

ASRock Rack Incorporation

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Taipei City 112, Taiwan (R.O.C.)

1.2 Specifications

MT-C224	
MB Physical Status	
Form Factor	Extended mini ITX
Dimension	7.8'' × 6.7'' (19.8 cm x 17.0 cm)
Processor System	
CPU	- Single socket H3 (LGA 1150) supports Intel® Xeon processor E3-1200 v3 series & Haswell i3 processors - Supports Hyper-Threading Technology
Socket	Single Socket H3 (LGA1150)
Chipset	Intel® C224
System Memory	
Capacity	- 4 x 240-pin DDR3 DIMM slots - Support up to 32GB DDR3 ECC UDIMM
Type	- Dual Channel DDR3 memory technology - Supports DDR3 1600/1333 ECC DIMM
Voltage	1.5V, 1.35V
Expansion Slot	
PCIe 3.0 x 8	1 slot
Storage	
SATA Controller	Intel® C224 : 4 x SATA3 6.0 Gb/s, 2 x SATA2 3.0 Gb/s, Support RAID 0, 1, 5, 10 and Intel® Rapid Storage
Ethernet	
Interface	Gigabit LAN 10/100/1000 Mb/s
LAN Controller	- 2 x Intel® i210 - Supports Wake-On-LAN - Supports Energy Efficient Ethernet 802.3az - Supports Dual LAN with Teaming function - Supports PXE
Management	
BMC Controller	ASPEED AST2300 : IPMI (Intelligent Platform Management Interface) 2.0 with iKVM support
IPMI Dedicated GLAN	1 x Realtek RTL8211E for dedicated management GLAN
Gracphics	
Controller	ASPEED AST2300
VRAM	DDR3 16MB
Rear Panel I/O	
VGA Port	1 x D-Sub
USB 3.0 Port	2

English

Lan Port	- 2 x RJ45 Gigabit Ethernet LAN ports
	- 1 x RJ45 Dedicated IPMI LAN port
	- LAN Ports with LED (ACT/LINK LED and SPEED LED)
UID Button/UID LED	1
DC IN	1x ATX 8-pin connector
Internal Connector	
Auxiliary Panel Header	1 (includes chassis intrusion, location button & LED, front LAN LED)
TPM Header	1
IPMB Header	1
BMC_SMBUS	2
SGPIO	1
Fan Header	5 x 4-pin
Power Connector	1 (18-pin, DC Input)+1 (4-pin, SATA power output)
USB 3.0 Header	1 (each supports 2 USB 3.0 ports)
USB 2.0 Header	1 (each supports 2 USB 2.0 ports)
PDB SMBUS	1 x 2.0mm 6-pin connector
NMI BTN	1
System BIOS	
BIOS Type	64Mb AMI UEFI Legal BIOS
BIOS Features	- Plug and Play (PnP)
	- ACPI 1.1 Compliance Wake Up Events
	- SMBIOS 2.3.1 Support
	- DRAM Voltage Multi-adjustment
	- ASRock Instant Flash
Hardware Monitor	
Temperature	- CPU Temperature Sensing
	- System Temperature Sensing
Fan	- CPU/Rear/Front Fan Tachometer
	- CPU Quiet Fan (Allow CPU Fan Speed Auto-Adjust by CPU Temperature)
	- CPU/Rear/Front Fan Multi-Speed Control
Voltage	Voltage Monitoring:
	SIO: +12V, +5V
	BMC: +3.3V, CPU Vcore, DRAM, 1.05V_PCH, +BAT, 3VSB, 5VSB, DC_IN 12V

Support OS	
OS	Microsoft® Windows®
	- Server 2008 R2 (64 bit)
	- Server 2012 (64 bit)
	- Server 2012 R2 (64 bit)
	Linux®
	- RedHat Enterprise Linux Server 5.9/6.4 (32 / 64 bit)
	- CentOS 5.9 / 6.4 (32 / 64 bit)
	- SUSE Enterprise Linux Server 11 SP3 (32 / 64 bit)
	- FreeBSD 9.1 (32 / 64 bit)
	- Fedora core 19 (64 bit)
	- UBuntu 12.04.2 (64 bit) / 12.10 (64 bit)
	Virtual
	- VMWare® ESXi 5.5
Environment	
Temperature	Operation temperature: 10°C ~ 35°C / Non operation temperature: -40°C ~ 70°C

1.3 Unique Features

ASRock Rack Racknstant Flash is a BIOS flash utility embedded in Flash ROM. This convenient BIOS update tool allows you to update system BIOS without entering operating systems first like MS-DOS or Windows*. With this utility, you can press the <F6> key during the POST or the <F2> key to enter into the BIOS setup menu to access ASRock Instant Flash. Just launch this tool and save the new BIOS file to your USB flash drive, floppy disk or hard drive, then you can update your BIOS only in a few clicks without preparing an additional floppy diskette or other complicated flash utility. Please be noted that the USB flash drive or hard drive must use FAT32/16/12 file system.

1.4 Motherboard Layout

17.0cm (6.7in)

19.8cm (7.8 in)

UID1

PDB_CONN1

SGPIO_1

PSU_SMB1

ME_RECOVERY1

FRNT_FAN1

SATA_PWR_CON

DDR3_B2 (64 bit, 240-pin module, White)

DDR3_B1 (64 bit, 240-pin module, Blue)

DDR3_A2 (64 bit, 240-pin module, White)

DDR3_A1 (64 bit, 240-pin module, Blue)

DC_IN1

USB 3.0
T: USB_2
B: USB_1

LAN2

BAT1

LAN1
(NCSI)

VGA1

IPMB_1

NMI_BTN1

IMPI_LAN1

PCIE1 (x8)

RoHS

MT-C224

FRNT_FAN2

CPU_FAN1

SMC_SMB_1

SMC_SMB_2

AUX_PANEL1

TPM1

PANEL1

USB_3_4

SATA_3   SATA_2

SATA_1   SATA_0

SATA_5   SATA_4

USB3_3_4

Intel
C224

FRNT_FAN3

BIOS
Chip

FRNT_FAN4

ASRock

1 2 3 4 5 6
7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
26 27 28 29 30

No.	Description
1	Power Distribution Board Power Connector (PDB_CONN1)
2	SGPIO Connector (SGPIO_1)
3	Power Distribution Board SMBus (PDB_SMB1)
4	ME Recovery Jumper (ME_RECOVERY1)
5	Front Fan Connector (FRONT_FAN1)
6	SATA Power Connector (SATA_PWR_CON) *(see p.23 for more details)*
7	2 x 240-pin DDR3 DIMM Slots (DDR3_B2, DDR3_A2, White)*
8	2 x 240-pin DDR3 DIMM Slots (DDR3_B1, DDR3_A1, Blue)*
9	Auxiliary Panel Header (AUX_PANEL1)
10	TPM Header (TPM1)
11	Front Fan Connector (FRONT_FAN2)
12	CPU Fan Connector (CPU_FAN1)
13	BMC SMBus Header (BMC_SMB_1)
14	SATA3 Connector (SATA_3), White
15	SATA3 Connector (SATA_2), White
16	BMC SMBus Header (BMC_SMB_2)
17	SATA3 Connector (SATA_1), White
18	SATA3 Connector (SATA_0), White
19	USB 2.0 Header (USB_3_4)
20	SATA2 Connector (SATA_4), Blue
21	SATA2 Connector (SATA_5), Blue
22	USB 3.0 Header (USB3_3_4)
23	System Panel Header (PANEL1)
24	Front Fan Connector (FRONT_FAN3)
25	Front Fan Connector (FRONT_FAN4)
26	PCIe 3.0 x8 Slot (PCIE1)
27	Intelligent Platform Management Bus header (IPMB_1)
28	Non Maskable Interrupt Button (NMI_BTN1)
29	LGA1150 CPU Socket
30	Realtime Clock Battery (BAT1)

For DIMM installation and configuration instructions, please see p.16 (Installation of Memory Modules (DIMM)) for more details.

1.5 I/O Panel
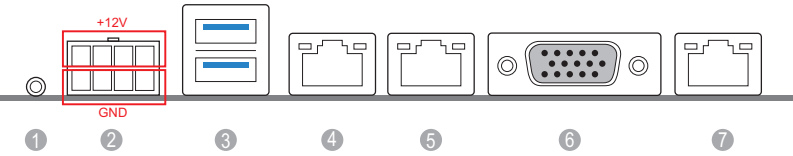
No.	Description	No.	Description
1	UID Switch and LED (UID1)	5	LAN RJ-45 Port (LAN1)(NCSI)*
2	ATX 8-pin Connector (DC_IN1)	6	VGA Port (VGA1)
3	USB 3.0 Ports (USB3_1_2)	7	LAN RJ-45 Port (IPMI_LAN)**
4	LAN RJ-45 Port (LAN2)*		

LAN Port LED Indications

*There are two LED next to the LAN port. Please refer to the table below for the LAN port LED indications.
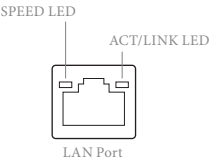
Dedicated IPMI LAN Port LED Indications

Activity / Link LED		Speed LED	
Status	Description	Status	Description
Off	No Link	Off	10Mbps connection
Blinking	Data Activity	Off	100Mbps connection
On	Link	Green	1Gbps connection

**There are two LEDs on each LAN port. Please refer to the table below for the LAN port LED indications.

SPEED LED

ACT/LINK LED
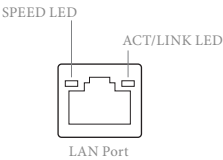
LAN Port

LAN Port (LAN1, LAN2) LED Indications

Activity / Link LED		Speed LED	
Status	Description	Status	Description
Off	No Link	Off	10Mbps connection
Blinking	Data Activity	Off	100Mbps connection
On	Link	Green	1Gbps connection

1.6 Block Diagram
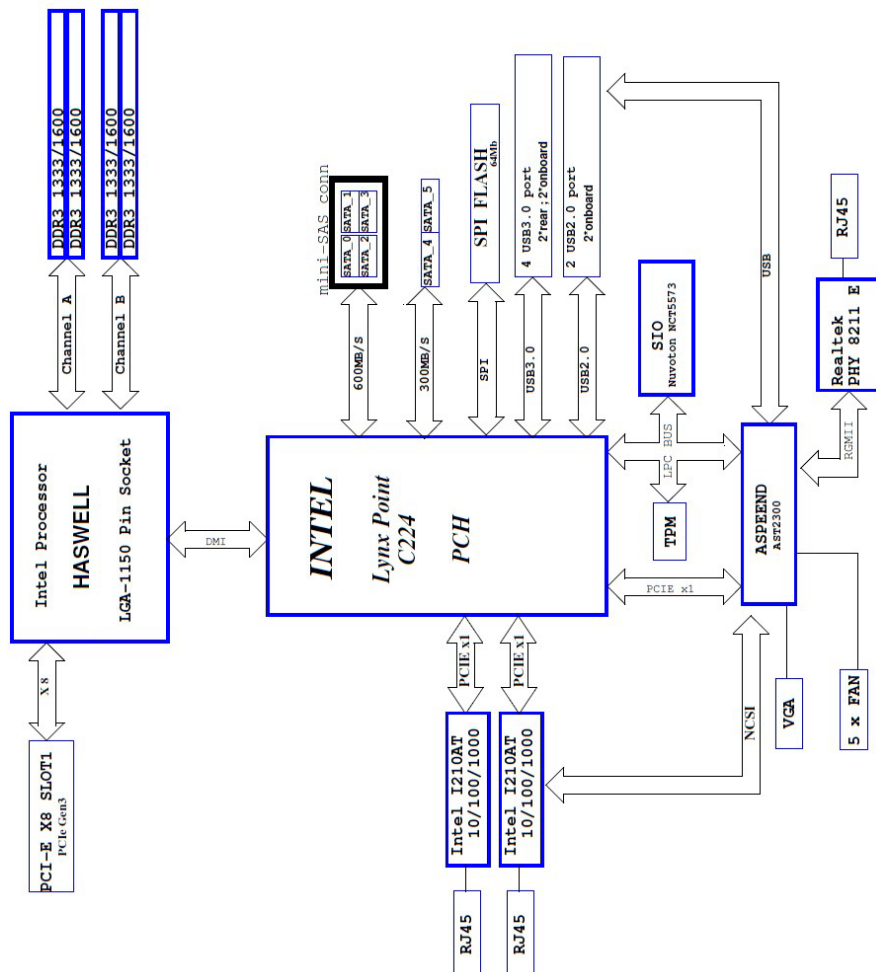
Chapter 2 Installation

This is an Extended mini ITX form factor (7.8" × 6.7", 19.8 cm x 17.0 cm) motherboard. Before you install the motherboard, study the configuration of your chassis to ensure that the motherboard fits into it.

> ⚠ *Make sure to unplug the power cord before installing or removing the motherboard. Failure to do so may cause physical injuries to you and damages to motherboard components.*

2.1 Screw Holes

Place screws into the holes indicated by circles to secure the motherboard to the chassis.

> ⚠ *Do not over-tighten the screws! Doing so may damage the motherboard.*

2.2 Pre-installation Precautions

Take note of the following precautions before you install motherboard components or change any motherboard settings.

1. Unplug the power cord from the wall socket before touching any components.
2. To avoid damaging the motherboard's components due to static electricity, NEVER place your motherboard directly on the carpet or the like. Also remember to use a grounded wrist strap or touch a safety grounded object before you handle the components.
3. Hold components by the edges and do not touch the ICs.
4. Whenever you uninstall any component, place it on a grounded anti-static pad or in the bag that comes with the component.
5. When placing screws into the screw holes to secure the motherboard to the chassis, please do not over-tighten the screws! Doing so may damage the motherboard.

> ⚠ *Before you install or remove any component, ensure that the power is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, and/or components.*

2.3 Installing the CPU

1. *Before you insert the 1150-Pin CPU into the socket, please check if the PnP cap is on the socket, if the CPU surface is unclean, or if there are any bent pins in the socket. Do not force to insert the CPU into the socket if above situation is found. Otherwise, the CPU will be seriously damaged.*
2. *Unplug all power cables before installing the CPU.*
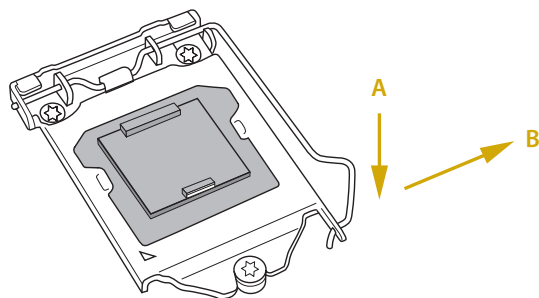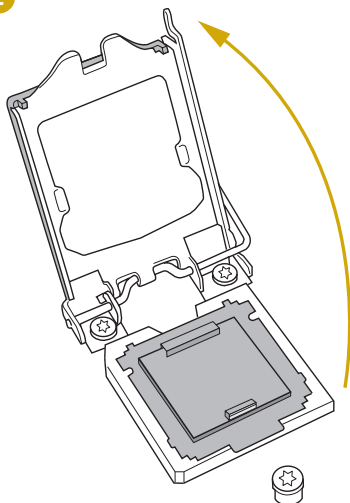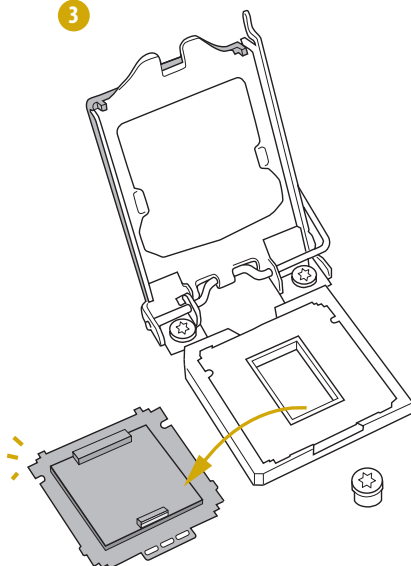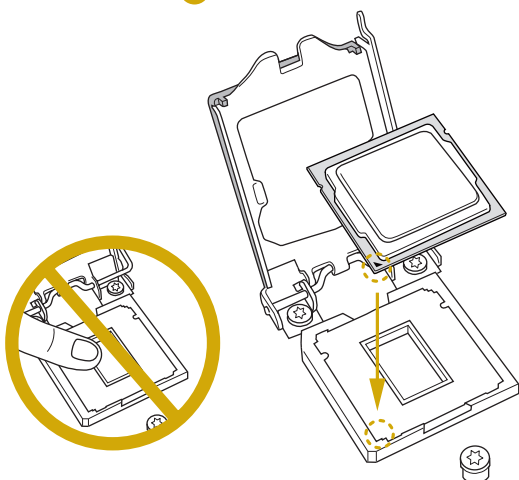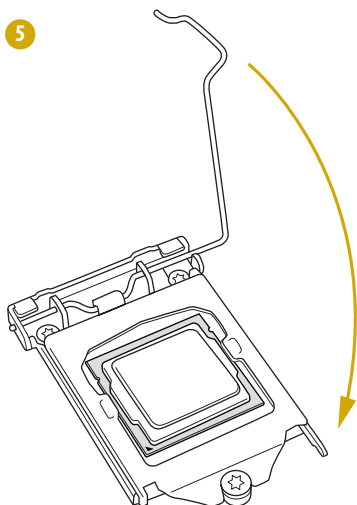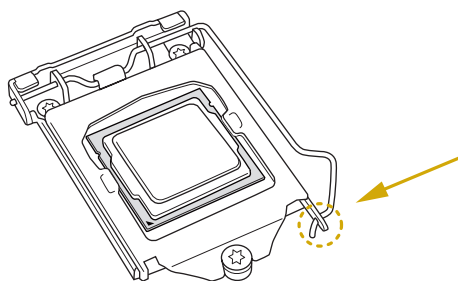
Please save and replace the cover if the processor is removed. The cover must be placed if you wish to return the motherboard for after service.

2.4 Installing the CPU Fan and Heatsink
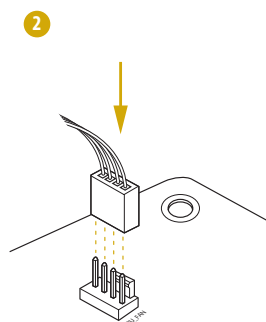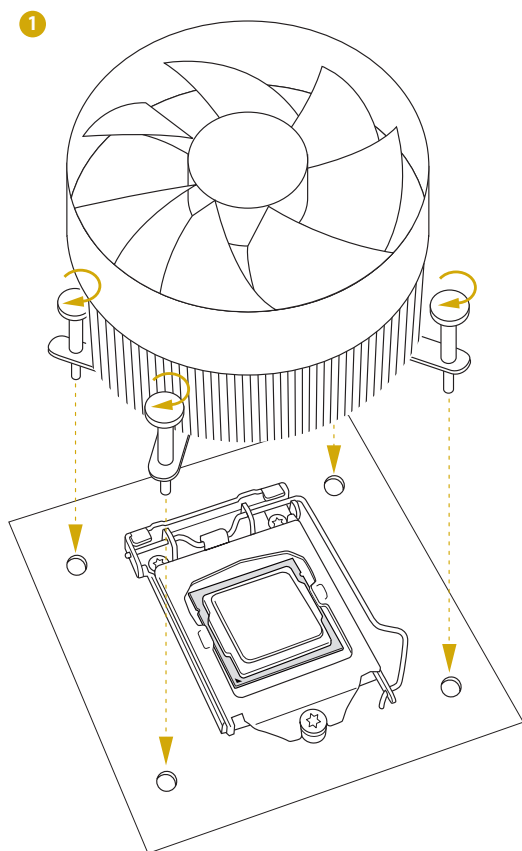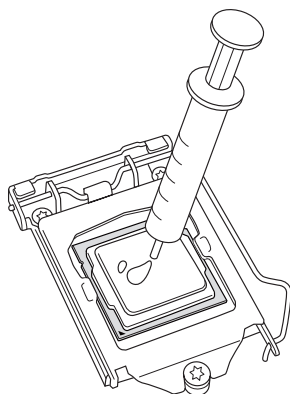
2.5 Installation of Memory Modules (DIMM)

Supported DIMM type: ECC Unbuffered DIMM

This motherboard provides eight 240-pin DDR3 (Double Data Rate 3) DIMM slots, and supports Dual Channel Memory Technology.

> ⚠ *The DIMM only fits in one correct orientation. It will cause permanent damage to the motherboard and the DIMM if you force the DIMM into the slot at incorrect orientation.*

If you want to install one memory module, you can install it in any one of the DIMM slots. If you want to install two or four memory modules, please refer to the table below for recommended configuration.

DDR3_B2	(64 bit, 240-pin module , White)
DDR3_B1	(64 bit, 240-pin module , Blue)
DDR3_A2	(64 bit, 240-pin module , White)
DDR3_A1	(64 bit, 240-pin module , Blue)

Dual Channel Memory Configuration

Priority	DDR3_A1	DDR3_A2	DDR3_B1	DDR3_B2
1		Populated		Populated
2	Populated		Populated	
3	Populated	Populated	Populated	Populated

> ⚠ 1. For dual channel configuration, you always need to install identical (the same brand, speed, size and chip-type) DDR3 DIMM pairs.
> 2. It is unable to activate Dual Channel Memory Technology with only one or three memory module installed.
> 3. It is not allowed to install a DDR or DDR2 memory module into a DDR3 slot; otherwise, this motherboard and DIMM may be damaged.
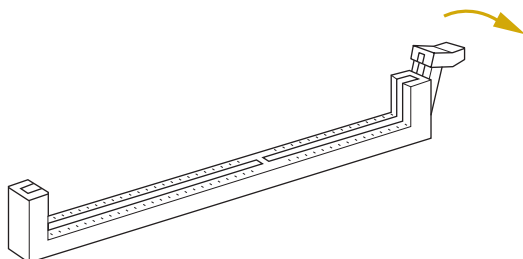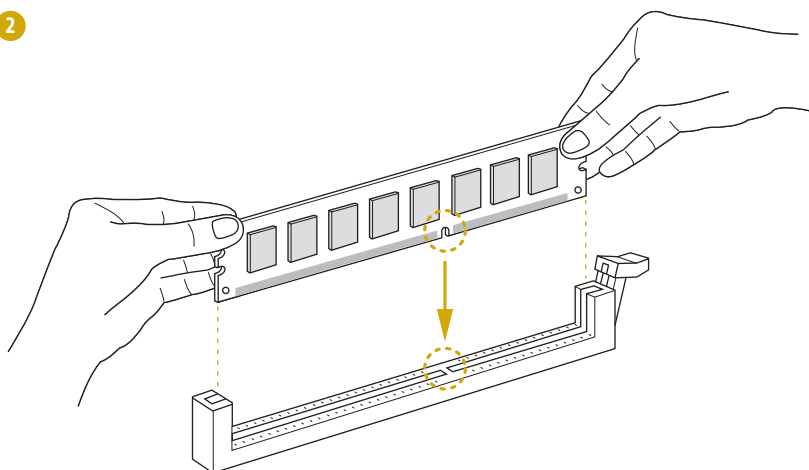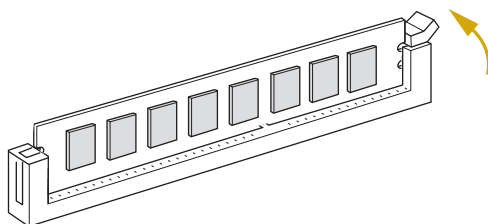
2.6 Expansion Slots (PCI and PCI Express Slots)

There is one PCI Express slot on this motherboard.

PCIE slot:
PCIE1 (PCIE 3.0 x8 slot) is used for PCI Express x8 lane width graphics cards.

Slot	Generation	Mechnical	Eletrical	Source
PCIE 1	3.0	x8	x8	Intel C224 chipset

Installing an expansion card

Step 1.   Before installing an expansion card, please make sure that the power supply is switched off or the power cord is unplugged. Please read the documentation of the expansion card and make necessary hardware settings for the card before you start the installation.

Step 2.   Remove the system unit cover (if your motherboard is already installed in a chassis).

Step 3.   Remove the bracket facing the slot that you intend to use. Keep the screws for later use.

Step 4.   Align the card connector with the slot and press firmly until the card is completely seated on the slot.

Step 5.   Fasten the card to the chassis with screws.

Step 6.   Replace the system cover.

2.7 Jumper Setup

The illustration shows how jumpers are setup. When the jumper cap is placed on the pins, the jumper is "Short". If no jumper cap is placed on the pins, the jumper is "Open". The illustration shows a 3-pin jumper whose pin1 and pin2 are "Short" when a jumper cap is placed on these 2 pins.

Short   Open
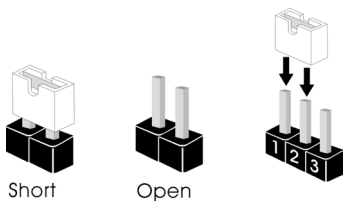
ME Recovery Jumper (3-pin ME_RECOVERY1) (see p.7, No. 4)	**1_2** Default **2_3** ME Recovery Mode

2.8 Onboard Headers and Connectors

> ⚠️ *Onboard headers and connectors are NOT jumpers. Do NOT place jumper caps over these headers and connectors. Placing jumper caps over the headers and connectors will cause permanent damage to the motherboard.*

System Panel Header
(9-pin PANEL1)
(see p.7, No. 23)

PLED+
PLED-
PWRBTN#
GND

1

GND
RESET#
GND
HDLED-
HDLED+
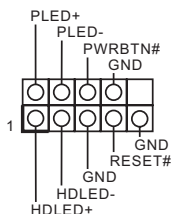
Connect the power switch, reset switch and system status indicator on the chassis to this header according to the pin assignments below. Note the positive and negative pins before connecting the cables.

> ⊕ *PWRBTN (Power Switch):*
> *Connect to the power switch on the chassis front panel. You may configure the way to turn off your system using the power switch.*
>
> *RESET (Reset Switch):*
> *Connect to the reset switch on the chassis front panel. Press the reset switch to restart the computer if the computer freezes and fails to perform a normal restart.*
>
> *PLED (System Power LED):*
> *Connect to the power status indicator on the chassis front panel. The LED is on when the system is operating. The LED keeps blinking when the system is in S1/S3 sleep state. The LED is off when the system is in S4 sleep state or powered off (S5).*
>
> *HDLED (Hard Drive Activity LED):*
> *Connect to the hard drive activity LED on the chassis front panel. The LED is on when the hard drive is reading or writing data.*
>
> *The front panel design may differ by chassis. A front panel module mainly consists of power switch, reset switch, power LED, hard drive activity LED, speaker and etc. When connecting your chassis front panel module to this header, make sure the wire assignments and the pin assignments are matched correctly.*

Auxiliary Panel Header
(18-pin AUX PANEL_1)
(see p.7, No. 9)
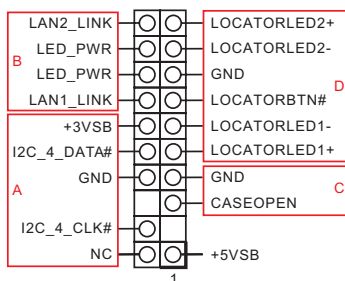
This header supports multiple functions on the front panel, including the front panel SMB, internet status indicator and chassis intrusion pin.

LAN2_LINK		LOCATORLED2+
LED_PWR		LOCATORLED2-
LED_PWR		GND
LAN1_LINK		LOCATORBTN#
+3VSB		LOCATORLED1-
I2C_4_DATA#		LOCATORLED1+
GND		GND
		CASEOPEN
I2C_4_CLK#		
NC		+5VSB

B   A   D   C

1

A. Front panel SMBus connecting pin (6-1 pin FPSMB)
This header allows you to connect SMBus (System Management Bus) equipment. It can be used for communication between peripheral equipment in the system, which has slower transmission rates, and power management equipment.

B. Internet status indicator (2-pin LAN1_LED, LAN2_LED)
These two 2-pin headers allow you to use the Gigabit internet indicator cable to connect to the LAN status indicator. When this indicator flickers, it means that the internet is properly connected.

C. Chassis intrusion pin (2-pin CHASSIS)
This header is provided for host computer chassis with chassis intrusion detection designs. In addition, it must also work with external detection equipment, such as a chassis intrusion detection sensor or a microswitch. When this function is activated, if any chassis component movement occurs, the sensor will immediately detect it and send a signal to this header, and the system will then record this chassis intrusion event. The default setting is set to the CASEOPEN and GND pin; this function is off.

D. Locator LED (6-pin LOCATOR)
This header is for the locator switch and LED on the front panel.
The LOCATORBTN# controls both LOCATORLED1 and LOCATORLED2. When the Locator button is pressed, both Locator LED 1 and 2 will be turned on.

Serial ATA2 Connectors
(Blue)
(SATA_4)
(see p.7, No. 20)
(SATA_5)
(see p.7, No. 21)

SATA_5   SATA_4

These two SATA2 connectors support SATA data cables for internal storage devices with up to 3.0 Gb/s data transfer rate.

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Serial ATA3 Connectors
(White)
(SATA_0)
(see p.7, No. 18)
(SATA_1)
(see p.7, No. 17)
(SATA_2)
(see p.7, No. 15)
(SATA_3)
(see p.7, No. 14)

SATA_3 SATA_2

SATA_1 SATA_0

These four SATA3 connectors support SATA data cables for internal storage devices with up to 6.0 Gb/s data transfer rate.

USB 2.0 Header
(9-pin USB_3_4)
(see p.7, No. 19)

DUMMY
GND — GND
P+7 — P+6
P-7 — P-6
USB_PWR — USB_PWR
1
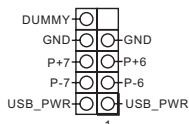
There is one header on this motherboard. Each USB 2.0 header can support two ports.

USB 3.0 Header
(19-pin USB3_3_4)
(see p.7, No. 22)

Vbus
Vbus — IntA_PB_SSRX-
IntA_PA_SSRX- — IntA_PB_SSRX+
IntA_PA_SSRX+ — GND
GND — IntA_PB_SSTX-
IntA_PA_SSTX- — IntA_PB_SSTX+
IntA_PA_SSTX+ — GND
GND — IntA_PB_D-
IntA_PA_D- — IntA_PB_D+
IntA_PA_D+ — Dummy
1
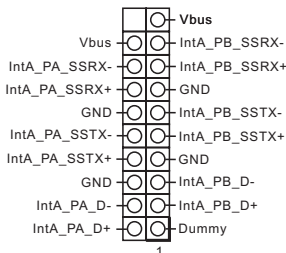
Besides two default USB 3.0 ports on the I/O panel, there is one USB 3.0 header on this motherboard. This USB 3.0 header can support two USB 3.0 ports.

CPU Fan Connector
(4-pin CPU_FAN1)
(see p.7, No. 12)

1 — GND
2 — + 12V
3 — CPU_FAN_SPEED
4 — FAN_SPEED_CONTROL
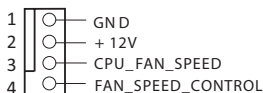
This motherboard provides a 4-Pin CPU fan (Quiet Fan) connector. If you plan to connect a 3-Pin CPU fan, please connect it to Pin 1-3.

Front Fan Connectors
(4-pin FRNT_FAN1)
(4-pin FRNT_FAN2)
(4-pin FRNT_FAN3)
(4-pin FRNT_FAN4)
(see p.7, No. 5, 11, 24, 25)

FAN_SPEED_CONTROL
FAN_SPEED
+12V
GND
1 2 3 4

1 — GND
2 — +12V
3 — FAN_SPEED
4 — FAN_SPEED_CONTROL
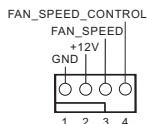
Please connect fan cables to the fan connectors and match the black wire to the ground pin. All fans support Fan Control.
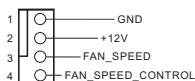
PDB Power Connector
(18-pin PDB_CONN1)
(see p.7, No. 1)

NC   DC_IN_2

18   10

9   1
GND
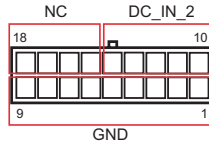
This motherboard provides a 18-pin PDB power connector.

🔍 *This motherboard supports two flexible power connection methods:*

External Connection:
If your system contains a power supply unit with an ATX 8-pin connector, simply connect it to the ATX 8-pin Connector (DC_IN1) on the rear I/O panel.

+12V

GND

Internal Connection:
Without an ATX 8-pin connector, connect your power supply to the DC 12V pins (DC_IN_2) in the PDB Power Connector (18-pin PDB_CONN1) via a transfer cable.

DC_IN_2

Even for a system with ATX power supply only, you still can connect it to the PDB Power Connector (18-pin PDB_CONN1) with a transfer cable.

SATA Power Connector
(4-pin SATA_PWR_
CON)
(see p.7, No. 6)

GND

+5V

+12V

This motherboard provides a 4-pin SATA power connector.

TPM Header
(17-pin TPM1)
(see p.7, No. 10)

F_CLKRUN#	GND
SERIRQ#	+3VSB
S_PWRDWN#	
GND	LAD0_L
LAD1_L	+3V
LAD2_L	LAD3_L
SMB_DATA_MAIN	TPM_RST#
SMB_CLK_MAIN	LFRAME#_L
GND	CK_33M_TPM
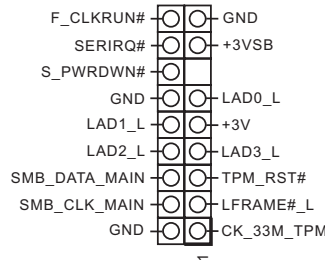
This connector supports Trusted Platform Module (TPM) system, which can securely store keys, digital certificates, passwords, and data. A TPM system also helps enhance network security, protects digital identities, and ensures platform integrity.

Serial General Purpose
Input/Output Headers
(7-pin SGPIO1)
(see p.7, No. 2)

SCLOCK
SLOAD ——— GND
GND ——— SDATAOUT
1
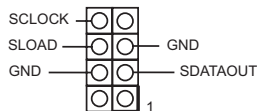
This header supports Serial Link interface for onboard SATA connections.

PDB SMBus
(PDB_SMB1)
(see p.7, No. 3)

Reserved Only
SMB_ALT#
Reserved Only
GND
SMB_DAT
SMB_CLK

1
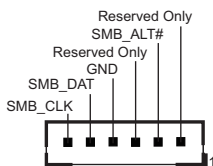
PDB SMBus monitors the status of the power supply.

⊕ *The PDB SMBus (PDB_SMB1) connector is a pseudo-PMBus connector particularly reserved for gathering power supply information. You can still connect it to a standard PMBus connector of power supply with a transfer cable.*

Non Maskable Interrupt
Button Header
(NMI_BTN1)
(see p.7, No. 28)

GND
CONTROL

1

Please connect a NMI device to this header.

Intelligent Platform
Management Bus header
(4-pin IPMB_1)
(see p.7, No. 27)

GND
No connect

IPMB_SDA
IPMB_SCL
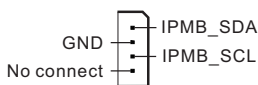
This 4-pin connector is used to provide a cabled base-board or front panel connection for value added features and 3rd-party add-in cards, such as Emergency Management cards, that provide management features using the IPMB.

Baseboard Management
Controller SMBus Headers
(5-pin BMC_SMB_1)
(see p.7, No. 13)
(5-pin BMC_SMB_2)
(see p.7, No. 16)

BMC_SMB_PRESENT_1_N
Power
BMC_SMBCLK7
GND
BMC_SMBDATA7
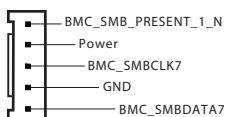
These headers are used for the SM BUS devices.

2.9 Driver Installation Guide

To install the drivers to your system, please insert the support CD to your optical drive first. Then, the drivers compatible to your system can be auto-detected and listed on the support CD driver page. Please follow the order from top to bottom to install those required drivers. Therefore, the drivers you install can work properly.

English

2.10 Dual LAN and Teaming Operation Guide

Dual LAN with Teaming enabled on this motherboard allows two single connections to act as one single connection for twice the transmission bandwidth, making data transmission more effective and improving the quality of transmission of distant images. Fault tolerance on the dual LAN network prevents network downtime by transferring the workload from a failed port to a working port.

> ⚠️ *The speed of transmission is subject to the actual network environment or status even with Teaming enabled.*

Before setting up Teaming, please make sure whether your Switch (or Router) supports Teaming (IEEE 802.3ad Link Aggregation). You can specify a preferred adapter in Intel PROSet. Under normal conditions, the Primary adapter handles all non-TCP/IP traffic. The Secondary adapter will receive fallback traffic if the primary fails. If the Preferred Primary adapter fails, but is later restored to an active status, control is automatically switched back to the Preferred Primary adapter.

Step 1

From **Device Manager**, open the properties of a team.

Step 2

Click the **Settings** tab.

Step 3

Click the **Modify Team** button.

Step 4

Select the adapter you want to be the primary adapter and click the **Set Primary** button.

If you do not specify a preferred primary adapter, the software will choose an adapter of the highest capability (model and speed) to act as the default primary. If a failover occurs, another adapter becomes the primary. The adapter will, however, rejoin the team as a non-primary.

English

Chapter 3 UEFI Setup Utility

3.1 Introduction

This section explains how to use the UEFI SETUP UTILITY to configure your system. The UEFI chip on the motherboard stores the UEFI SETUP UTILITY. You may run the UEFI SETUP UTILITY when you start up the computer. Please press <F2> or <Del> during the Power-On-Self-Test (POST) to enter the UEFI SETUP UTILITY; otherwise, POST will continue with its test routines.

If you wish to enter the UEFI SETUP UTILITY after POST, restart the system by pressing <Ctrl> + <Alt> + <Delete>, or by pressing the reset button on the system chassis. You may also restart by turning the system off and then back on.

> ⚠ *Because the UEFI software is constantly being updated, the following UEFI setup screens and descriptions are for reference purpose only, and they may not exactly match what you see on your screen.*

3.1.1 UEFI Menu Bar

The top of the screen has a menu bar with the following selections:

Item	Description
Main	To set up the system time/date information
Advanced	To set up the advanced UEFI features
H/W Monitor	To display current hardware status
Boot	To set up the default system device to locate and load the Operating System
Security	To set up the security features
Event Logs	For event log configuration
Server Mgmt	To manage the server
Exit	To exit the current screen or the UEFI SETUP UTILITY

Use <←> key or <→> key to choose among the selections on the menu bar, and then press <Enter> to get into the sub screen. You can also use the mouse to click your required item.

English

3.1.2 Navigation Keys

Please check the following table for the function description of each navigation key.

Navigation Key(s)	Function Description
← / →	Moves cursor left or right to select Screens
↑ / ↓	Moves cursor up or down to select items
+ / -	To change option for the selected items
<Tab>	Switch to next function
<Enter>	To bring up the selected screen
<PGUP>	Go to the previous page
<PGDN>	Go to the next page
<HOME>	Go to the top of the screen
<END>	Go to the bottom of the screen
<F1>	To display the General Help Screen
<F7>	Discard changes and exit the UEFI SETUP UTILITY
<F9>	Load optimal default values for all the settings
<F10>	Save changes and exit the UEFI SETUP UTILITY
<F12>	Print screen
<ESC>	Jump to the Exit Screen or exit the current screen

3.2 Main Screen

Once you enter the UEFI SETUP UTILITY, the Main screen will appear and display the system overview. The Main screen provides system overview information and allows you to set the system time and date.

```
             Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
   Main  Advanced  H/W Monitor  Boot  Security  Event Logs  Server Mgmt  Exit

   UEFI Version      : MT-C224  L0.06                    Set the Date. Use Tab to
   BMC Version       : 4.3.0                             switch between Date elements.

   Processor Type    : Intel(R) Xeon(R) CPU E3-1285 v3 @ 3.60GHz

   Processor Speed   : 3600MHz
   Microcode Update  : 306C3/9
   Cache Size        : 8192KB

   Total Memory      : 4096MB
                       Single-Channel Memory Mode
   DDR3_A1           : 4096MB(DDR3-1600) with ECC
   DDR3_A2           : None
   DDR3_B1           : None                             ↔: Select Screen
   DDR3_B2           : None                             ↑↓: Select Item
                                                        Enter: Select
   System Date                      [Fri 11/29/2013]    +/-: Change Option
   System Time                      [00:29:44]          F1: General Help
                                                        F7: Discard Changes
                                                        F9: Load UEFI Defaults
                                                        F10: Save and Exit
                                                        ESC: Exit




             Version 2.15.1234. Copyright (C) 2012 American Megatrends, Inc.
```

3.3 Advanced Screen

In this section, you may set the configurations for the following items: CPU Configuration, North Bridge Configuration, South Bridge Configuration, Storage Configuration, Super IO Configuration, ACPI Configuration, USB Configuration, WHEA Configuration, Intel Server Platform Services, Serial Port Console Redirection, Voltage Control and Instant Flash.

```
            Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
     Main  Advanced  H/W Monitor  Boot  Security  Event Logs  Server Mgmt  Exit

  ▶ CPU Configuration                               CPU Configuration Parameters
  ▶ North Bridge Configuration
  ▶ South Bridge Configuration
  ▶ Storage Configuration
  ▶ Super IO Configuration
  ▶ ACPI Configuration
  ▶ USB Configuration
  ▶ WHEA Configuration
  ▶ Intel Server Platform Services
  ▶ Serial Port Console Redirection
  ▶ Voltage Control

    UEFI Update Utility                             ↔: Select Screen
                                                    ↑↓: Select Item
  ▶ Instant Flash                                   Enter: Select
                                                    +/-: Change Option
                                                    F1: General Help
                                                    F7: Discard Changes
                                                    F9: Load UEFI Defaults
                                                    F10: Save and Exit
                                                    ESC: Exit



            Version 2.15.1234. Copyright (C) 2012 American Megatrends, Inc.
```

⚠ *Setting wrong values in this section may cause the system to malfunction.*

3.3.1 CPU Configuration

```
                Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
        Advanced

  Intel(R) Xeon(R) CPU E3-1285 v3 @ 3.60GHz         ▲  enable/disable Spread Spectrum.
  Max CPU Speed                      3600 MHz
  Min CPU Speed                      800 MHz
  Processor Cores                    4
  Intel HT Technology                Supported
  Intel VT-x Technology              Supported
  Intel SMX Technology               Supported
  64-bit                             Supported

  Spread Spectrum                    [Disabled]
  Intel Hyper Threading Technology   [Enabled]
  Active Processor Cores             [All]
  No-Execute Memory Protection       [Enabled]
  Intel Virtualization Technology    [Enabled]    ──────────────────────────────
  Hardware Prefetcher                [Enabled]    ↔: Select Screen
  Adjacent Cache Line Prefetch       [Enabled]    ↑↓: Select Item
  CPU AES                            [Enabled]    Enter: Select
  Intel SpeedStep Technology         [Enabled]    +/-: Change Option
  Intel Turbo Boost Technology       [Enabled]    F1: General Help
  Energy Performance                 [Performance] F7: Discard Changes
  CPU C States Support               [Enabled]    F9: Load UEFI Defaults
  CPU C3 State Support               [Enabled]    F10: Save and Exit
  CPU C6 State Support               [Enabled]    ESC: Exit
  CPU C7 State Support               [Enabled]
  Package C State Support            [Disabled]  ▼

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```

Spread Spectrum

Use this item to enable or disable the spread spectrum feature. The default valu is [Disabled].

Intel Hyper Threading Technology

Intel Hyper Threading Technology allows multiple threads to run on each core, so that the overall performance on threaded software is improved.

Active Processor Cores

Select the number of cores to enable in each processor package.

No-Execute Memory Protection

Processors with No-Execution Memory Protection Technology may prevent certain classes of malicious buffer overflow attacks.

Intel Virtualization Technology

Intel Virtualization Technology allows a platform to run multiple operating systems and applications in independent partitions, so that one computer system can function as multiple virtual systems.

Hardware Prefetcher

Automatically prefetch data and code for the processor. Enable for better performance.

English

31

Adjacent Cache Line Prefetch

Automatically prefetch the subsequent cache line while retrieving the currently requested cache line. Enable for better performance.

CPU AES

Use this item to enable or disable CPU Advanced Encryption Standard instructions.

Intel SpeedStep Technology

Intel SpeedStep technology is Intel's new power saving technology. Processors can switch between multiple frequencies and voltage points to enable power saving. The default value is [Enabled]. Configuration options: [Enabled] and [Disabled]. If you install Windows® Vista™ / 7 / 8 and want to enable this function, please set this item to [Enabled]. This item will be hidden if the current CPU does not support Intel(R) SpeedStep technology.

⚠️ *Please note that enabling this function may reduce CPU voltage and lead to system stability or compatibility issues with some power supplies. Please set this item to [Disabled] if above issues occur.*

Intel Turbo Boost Technology

Use this item to enable or disable Intel Turbo Boost Mode Technology. Turbo Boost Mode allows processor cores to run faster than marked frequency in specific conditions. The default value is [Enabled].

Energy Performance

Use this item to configure energy performance.

CPU C States Support

Enable CPU C States Support for power saving. It is recommended to keep C3, C6 and C7 all enabled for better power saving performance.

CPU C3 State Support

Enable C3 sleep state for lower power consumption.

CPU C6 State Support

Enable C6 deep sleep state for lower power consumption.

CPU C7 State Support

Enable C7 deep sleep state for lower power consumption.

Package C State Support

Enable CPU, PCIe, Memory, Graphics C State Support for power saving.

Intel TXT(LT) Support

Use this to enable or disable Intel Trusted Execution Technology.

3.3.2 North Bridge Configuration

```
              Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
      Advanced

 VT-d Capability                    Supported                 Select a primary VGA.

 Primary Graphics Adapter           [PCI Express]
 DRAM Frequency                     [Auto]
 VT-d                               [Enabled]
 PCIE1 Link Speed                   [Auto]
 OnBoard VGA                        [Auto]




                                                             ↔: Select Screen
                                                             ↑↓: Select Item
                                                             Enter: Select
                                                             +/-: Change Option
                                                             F1: General Help
                                                             F7: Discard Changes
                                                             F9: Load UEFI Defaults
                                                             F10: Save and Exit
                                                             ESC: Exit

              Version 2.15.1234. Copyright (C) 2012 American Megatrends, Inc.
```

Primary Graphics Adapter

If both AGP card and PCI Express graphics card are installed on the motherboard, you may use this option to select PCI Express or Onboard as the primary graphics adapter.

DRAM Frequency

If [Auto] is selected, the motherboard will detect the memory module(s) inserted and assigns appropriate frequency automatically. You may also select other value as operating frequency: [DDR3-1066], [DDR3-1333] and [DDR3-1600].

VT-d

Use this item to enable/disable Intel(R) Virtualization Technology for Directed I/O. The default value is [Enabled].

PCIE1 Link Speed

This allows you to select PCIE 1 Link Speed. The default value is [Auto].

Onboard VGA

Use this to enable or disable the Onboard VGA function. The default value is [Auto].

*This item is not available when the Primary Graphic Adapter is set to [Onboard].

3.3.3 South Bridge Configuration

```
                Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
        Advanced

   Onboard LAN1                     [Enabled]              To Enable or Disable Onboard
   Onboard LAN2                     [Enabled]              LAN

   Restore on AC/Power Loss         [Last State]




                                                          ↔: Select Screen
                                                          ↑↓: Select Item
                                                          Enter: Select
                                                          +/-: Change Option
                                                          F1: General Help
                                                          F7: Discard Changes
                                                          F9: Load UEFI Defaults
                                                          F10: Save and Exit
                                                          ESC: Exit



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```

Onboard LAN1

This allows you to enable or disable the Onboard LAN 1 feature.

Onboard LAN2

This allows you to enable or disable the Onboard LAN 2 feature.

Restore on AC/Power Loss

This allows you to set the power state after an unexpected AC/power loss. If [Power Off] is selected, the AC/power remains off when the power recovers. If [Power On] is selected, the AC/power resumes and the system starts to boot up when the power recovers. If [Last State] is selected, the AC/power resumes or remains off when the power recovers, depending on the last state when an unexpected AC/power loss occurs.

English

3.3.4 Storage Configuration

```
                Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
       Advanced

    SATA Controller(s)              [Enabled]              Enable/disable the SATA
    SATA Mode Selection             [AHCI]                 controllers.
    SATA Aggressive Link Power Mgmt [Enabled]
    SATA RX Value                   [0.330  (5.955537 dB)]
    Hard Disk S.M.A.R.T             [Disabled]

  ▶ SATA_0    : Not Detected
  ▶ SATA_1    : Not Detected
  ▶ SATA_2    : Not Detected
  ▶ SATA_3    : Not Detected
  ▶ SATA_4    : Not Detected
  ▶ SATA_5    : Not Detected

                                                          ↔: Select Screen
                                                          ↑↓: Select Item
                                                          Enter: Select
                                                          +/-: Change Option
                                                          F1: General Help
                                                          F7: Discard Changes
                                                          F9: Load UEFI Defaults
                                                          F10: Save and Exit
                                                          ESC: Exit

                Version 2.15.1234. Copyright (C) 2012 American Megatrends, Inc.
```

SATA Controller(s)

Use this item to enable or disable the SATA Controller feature.

SATA Mode Selection

This item is for SATA3_0 to SATA3_5 ports. Use this to select SATA mode. Configuration options: [IDE], [AHCI] and [RAID]. The default value is [AHCI].

> ⚠ *AHCI (Advanced Host Controller Interface) supports NCQ and other new features that will improve SATA disk performance but IDE mode does not have these advantages.*

SATA Aggressive Link Power Management

Use this item to configure SATA Aggressive Link Power Management.

SATA RX Value

Use this to select a different value if the SATA port has HDD compatibility issue.

Hard Disk S.M.A.R.T.

Use this item to enable or disable the S.M.A.R.T. (Self-Monitoring, Analysis, and Reporting Technology) feature. Configuration options: [Disabled] and [Enabled].

Depending on how many SATA ports you have, you will see SATA_x (x means number) listed on the screen, with its status indicated as SATA device [(Model Name)] or [Not Detected].

Enter either one of the options will see the followings:

External SATA_X

Use this item to enable SATA safe removal notifications. Please note that the SATA device will be downgraded to SATA2.

Hot Plug

Use this item to enable or disable Hot Plug for the designated port.

SATA Device Type

Use this item to identify the SATA port is connected to Solid State Drive or Hard Disk Drive.

English

3.3.5 Super IO Configuration

```
           Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
    Advanced

▶ Serial Port 1 Configuration                        Set Parameters of Serial Port
▶ SOL Configuration                                  1 (COM1)




                                                     ↔: Select Screen
                                                     ↑↓: Select Item
                                                     Enter: Select
                                                     +/-: Change Option
                                                     F1: General Help
                                                     F7: Discard Changes
                                                     F9: Load UEFI Defaults
                                                     F10: Save and Exit
                                                     ESC: Exit



           Version 2.15.1234. Copyright (C) 2012 American Megatrends, Inc.
```
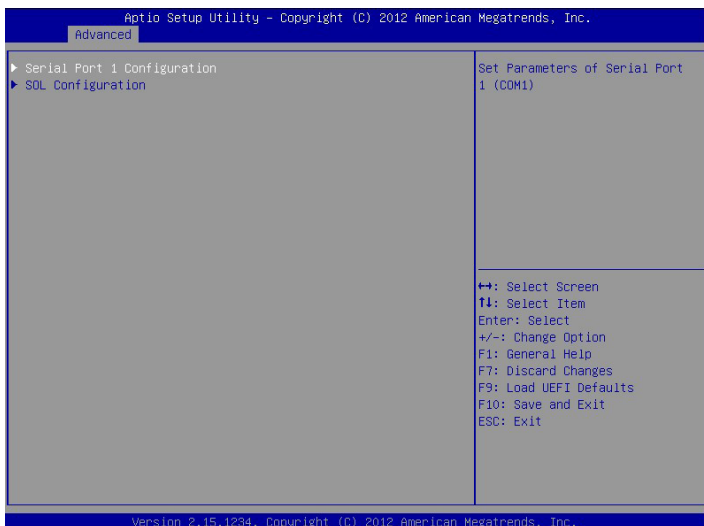
Serial Port 1 Configuration

Use this item to configure the onboard serial port 1.

Select and enter the "Serial Port 1 Configuration" and you will see the followings:

Serial Port
Use this item to enable or disable the onboard serial port.

Change Settings
Use this item to select an optimal setting for Super IO device.

SOL Configuration

Use this item to configrue parameters of SOL (Serial Over Lan).

SOL Port
Use this item to enable or disable the onboard serial port.

3.3.6 ACPI Configuration

```
                  Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
         Advanced

 ACPI HPET Table                          [Enabled]              Enable the High Precision
                                                                 Event Timer for better
 PCIE Devices Power On                    [Disabled]             performance and to pass WHQL
 Ring-In Power On                         [Disabled]             tests.
 RTC Alarm Power On                       [By OS]




                                                                 →←: Select Screen
                                                                 ↑↓: Select Item
                                                                 Enter: Select
                                                                 +/-: Change Option
                                                                 F1: General Help
                                                                 F7: Discard Changes
                                                                 F9: Load UEFI Defaults
                                                                 F10: Save and Exit
                                                                 ESC: Exit



                  Version 2.15.1234. Copyright (C) 2012 American Megatrends, Inc.
```

ACPI HPET Table

Use this item to enable or disable ACPI HPET Table. The default value is [Enabled]. Please set this option to [Enabled] if you plan to use this motherboard to submit Windows˚ certification.

PCIE Devices Power On

Use this item to enable or disable PCIE devices to turn on the system from the power-soft-off mode.

Ring-In Power On

Use this item to enable or disable Ring-In signals to turn on the system from the power-soft-off mode.

RTC Alarm Power On

Use this item to enable or disable RTC (Real Time Clock) to power on the system.

3.3.7 USB Configuration

```
            Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
      Advanced

  USB Controller                    [Enabled]              Mode of operation of Intel
  Intel USB3.0 Mode                 [Smart Auto]           USB3.0 controller.
  Legacy USB Support                [Enabled]
  Legacy USB 3.0 Support            [Enabled]




                                                           ↔: Select Screen
                                                           ↑↓: Select Item
                                                           Enter: Select
                                                           +/-: Change Option
                                                           F1: General Help
                                                           F7: Discard Changes
                                                           F9: Load UEFI Defaults
                                                           F10: Save and Exit
                                                           ESC: Exit


            Version 2.15.1234. Copyright (C) 2012 American Megatrends, Inc.
```

USB Controller

Use this item to enable or disable the use of USB controller.

Intel USB 3.0 Mode

Use this item to enable or disable the use of Intel USB 3.0 mode.

Legacy USB Support

Use this option to select legacy support for USB devices. There are four configuration options: [Enabled], [Auto], [Disabled] and [UEFI Setup Only]. The default value is [Enabled]. Please refer to below descriptions for the details of these four options:

Option	Description
Enabled	Enables support for legacy USB.
Disabled	USB devices are not allowed to use under legacy OS and UEFI setup when [Disabled] is selected. If you have USB compatibility issues, it is recommended to select [Disabled] to enter OS.
Auto	Enables legacy support if USB devices are connected.
UEFI Setup Only	SB devices are allowed to use only under UEFI setup and Windows / Linux OS.

Legacy USB 3.0 Support

Use this option to enable or disable legacy support for USB 3.0 devices. The default value is [Enabled].

3.3.8 WHEA Configuration

```
              Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
        Advanced

  WHEA Support                        [Enabled]            Enable or disable Windows
                                                           Hardware Error Architecture.





                                                           ───────────────────────────
                                                           ↔: Select Screen
                                                           ↑↓: Select Item
                                                           Enter: Select
                                                           +/-: Change Option
                                                           F1: General Help
                                                           F7: Discard Changes
                                                           F9: Load UEFI Defaults
                                                           F10: Save and Exit
                                                           ESC: Exit


              Version 2.15.1234. Copyright (C) 2012 American Megatrends, Inc.
```
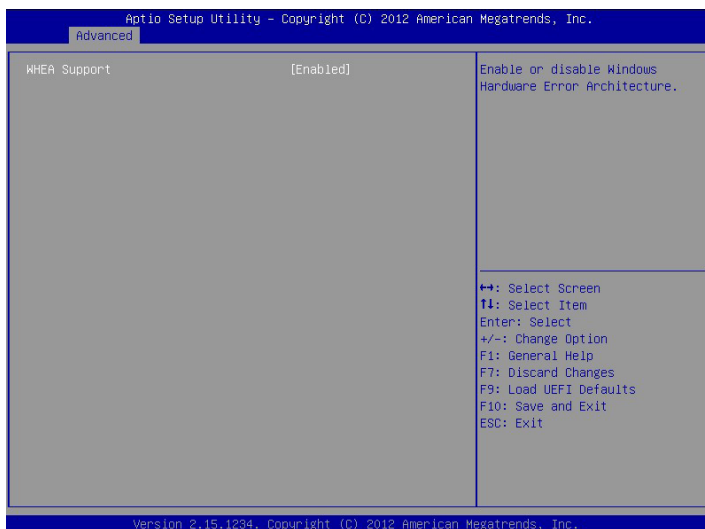
WHEA Support

Use this option to enable or disable Windows Hardware Error Architecture. The default value is [Enabled].

3.3.9 Intel Server Platform Services

```
                 Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
        Advanced

    Intel Server Platform Services Configuration

    SPS Version           :            3.0.4.164

    ME FW State           :             SPS ME FW Active



                                                        ↔: Select Screen
                                                        ↑↓: Select Item
                                                        Enter: Select
                                                        +/-: Change Option
                                                        F1: General Help
                                                        F7: Discard Changes
                                                        F9: Load UEFI Defaults
                                                        F10: Save and Exit
                                                        ESC: Exit



                 Version 2.15.1234. Copyright (C) 2012 American Megatrends, Inc.
```
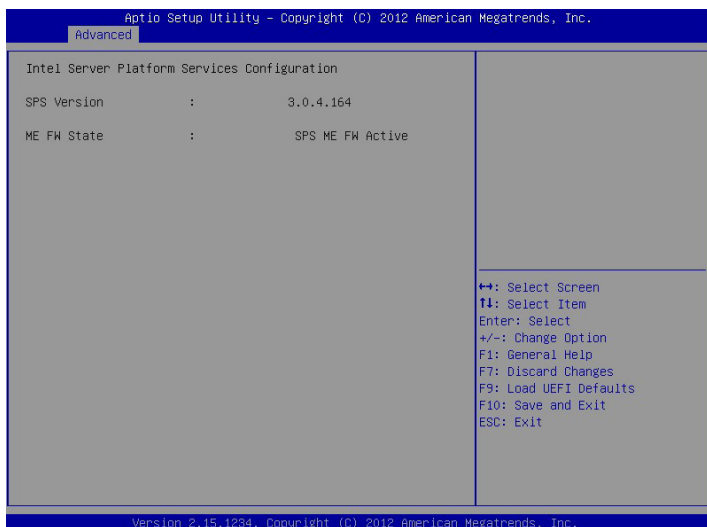
Intel Server Platform Services

Configure Intel Server Platform Services.

3.3.10 Serial Port Console Redirection

```
            Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
      Advanced

                                                              Console Redirection Enable or
     COM1                                                     Disable.
     Console Redirection                [Disabled]
   ▶ Console Redirection Settings

     SOL
     Console Redirection                [Disabled]
   ▶ Console Redirection Settings

     Serial Port for Out-of-Band Management/
     Windows Emergency Management Services (EMS)
     Console Redirection                [Enabled]             ↔: Select Screen
   ▶ Console Redirection Settings                             ↑↓: Select Item
                                                              Enter: Select
                                                              +/-: Change Option
                                                              F1: General Help
                                                              F7: Discard Changes
                                                              F9: Load UEFI Defaults
                                                              F10: Save and Exit
                                                              ESC: Exit


            Version 2.15.1234. Copyright (C) 2012 American Megatrends, Inc.
```

Console Redirection

Use this option to enable or disable Console Redirection. If this item is set to Enabled, you can select a COM Port to be used for Console Redirection.

Console Redirection Settings

Use this option to configure Console Redirection Settings, and specify how your computer and the host computer to which you are connected exchange information.

Out-of-Band-Mgmt (Management) Port
Use this item to select the port to be used for out-of-band management. The options include [COM1] and [SOL].

Terminal Type
Use this item to select the preferred terminal emulation type for out-of-band management. It is recommended to select [VT-UTF8].

Option	Description
VT100	ASCII character set
VT100+	Extended VT100 that supports color and function keys
VT-UTF8	UTF8 encoding is used to map Unicode chars onto 1 or more bytes
ANSI	Extended ASCII character set

English

43

Bits Per Second

Use this item to select the serial port transmission speed. The speed used in the host computer and the client computer must be the same. Long or noisy lines may require lower transmission speed. The options include [9600], [19200], [57600] and [115200].

Data Bits

Use this item to set the data transmission size. The options include [7] and [8] (Bits).

Parity

Use this item to select the parity bit. The options include [None], [Even], [Odd], [Mark] and [Space].

Stop Bits

The item indicates the end of a serial data packet. The standard setting is [1] Stop Bit. Select [2] Stop Bits for slower devices.

Flow Control

Use this item to set the flow control to prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a "stop" signal can be sent to stop the data flow. Once the buffers are empty, a "start" signal can be sent to restart the flow. Harware flow uses two wires to send start/stop signals. The options include [None], [Hardware RTS/CTS], and [Software Xon/Xoff].

VT-UTF8 Combo Key Support

Use this item to enable or disable the VT-UTF8 Combo Key Support for ANSI/VT100 terminals.

Recorder Mode

Use this item to enable or disable Recorder Mode to capture terminal data and send it as text messages.

Resolution 100x31

Use this item to enable or disable extended terminal resolution support.

Legacy OS Redirection Resolution

Use this item to select the number of rows and columns used in legacy OS redirection.

Putty Keypad

Use this item to select Function Key and Keypad on Putty.

Redirection After BIOS POST

If the [LoadBooster] is selected, legacy console redirection is disabled before booting to legacy OS. If [Always Enabled] is selected, legacy console redirection is enabled for legacy OS. The default value is [Always Enabled].

3.3.11 Voltage Control

```
              Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
    Advanced

 Voltage Control                                        DRAM Voltage Configuration.

 DRAM Voltage                        [Auto]
 PCH Voltage                         [Auto]




                                                        ↔: Select Screen
                                                        ↑↓: Select Item
                                                        Enter: Select
                                                        +/–: Change Option
                                                        F1: General Help
                                                        F7: Discard Changes
                                                        F9: Load UEFI Defaults
                                                        F10: Save and Exit
                                                        ESC: Exit



              Version 2.15.1234. Copyright (C) 2012 American Megatrends, Inc.
```
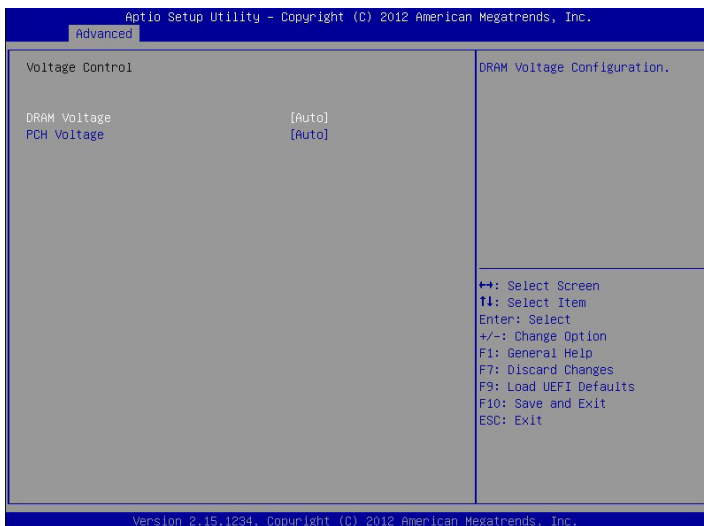
DRAM Voltage

Use this to select DRAM Voltage. The default value is [Auto].

PCH Voltage

Use this to select PCH Voltage. The default value is [Auto].

3.3.12 Instant Flash

Instant Flash is a UEFI flash utility embedded in Flash ROM. This convenient UEFI update tool allows you to update system UEFI without entering operating systems first like MS-DOS or Windows*. Just save the new UEFI file to your USB flash drive, floppy disk or hard drive and launch this tool, then you can update your UEFI only in a few clicks without preparing an additional floppy diskette or other complicated flash utility. Please be noted that the USB flash drive or hard drive must use FAT32/16/12 file system. If you execute Instant Flash utility, the utility will show the UEFI files and their respective information. Select the proper UEFI file to update your UEFI, and reboot your system after the UEFI update process is completed.

3.4 H/W Monitor Screen (Hardware Health Event Monitoring)

In this section, it allows you to monitor the status of the hardware on your system, including the parameters of the CPU temperature, motherboard temperature, CPU fan speed, chassis fan speed, and the critical voltage.

```
                    Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
         Main  Advanced  H/W Monitor  Boot  Security  Event Logs  Server Mgmt  Exit

                                                         ▲  Fan Speed Control.
    ATX+5VSB                         : 5.137 V
    +3VSB                            : 3.463 V
    Vcore                            : 1.754 V
    VCCM                             : 1.515 V
    +1.05                            : 1.072 V
    VCCIO_OUT                        : 1.016 V
    BAT                              : 0.029 V
    CPU_FAN1                         : 2900 RPM
    FRNT_FAN1                        N/A
    FRNT_FAN2                        N/A
    FRNT_FAN3                        N/A
    FRNT_FAN4                        N/A
    CPU Temperature                  N/A                  ↔: Select Screen
    M/B Temperature                  : 40.0 °C            ↑↓: Select Item
                                                          Enter: Select
    + 5.00V                          : +5.160 V           +/-: Change Option
    + 12.00V                         : +12.091 V          F1: General Help
    + 3.30V                          : +3.472 V           F7: Discard Changes
                                                          F9: Load UEFI Defaults
    CPU Fan 1 Setting                [Smart Fan]          F10: Save and Exit
    FRNT Fan 1 Setting               [Smart Fan]          ESC: Exit
    FRNT Fan 2 Setting               [Smart Fan]
    FRNT Fan 3 Setting               [Smart Fan]
    FRNT Fan 4 Setting               [Smart Fan]       ▼

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```

CPU_FAN 1 Setting

This allows you to set the CPU fan 1's speed. The default value is [Smart Fan].

FRNT_FAN 1 Setting

This allows you to set the front fan 1's speed. The default value is [Smart Fan].

FRNT_FAN 2 Setting

This allows you to set the front fan 2's speed. The default value is [Smart Fan].

FRNT_FAN 3 Setting

This allows you to set the front fan 3's speed. The default value is [Smart Fan].

FRNT_FAN 4 Setting

This allows you to set the front fan 4's speed. The default value is [Smart Fan].

English

Set Smart Fan Temp and Duty

Smart Fan Duty Control
Smart Fan Duty x (x means 1 to 11 stage)
This allows you to set duty cycle for each stage.

Smart Fan Temp Control
Smart Fan Temp x (x means 1 to 11 stage)
This allows you to set temperature for each stage.

Watch Dog Timer

This allows you to enable or disable the Watch Dog Timer. The default value is [Disabled].

Case Open Feature

This allows you to enable or disable the Case Open Feature. The default value is [Enabled].

3.5 Boot Screen

In this section, it will display the available devices on your system for you to configure the boot settings and the boot priority.

```
              Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
        Main  Advanced  H/W Monitor  Boot  Security  Event Logs  Server Mgmt  Exit

    Boot Option Priorities                                    Sets the system boot order
    Boot Option #1                    [USB: KingstonDataTr...]
    Boot Option #2                    [UEFI: KingstonDataT...]
    Boot Option #3                    [UEFI: Built-in EFI ...]

    USB Device BBS Priorities


    Boot From Onboard LAN             [Disabled]

    Setup Prompt Timeout              1
    Bootup Num-Lock                   [On]
    Full Screen Logo                  [Enabled]
      AddOn ROM Display               [Enabled]                →←: Select Screen
  ▶ CSM parameters                                              ↑↓: Select Item
                                                               Enter: Select
                                                               +/-: Change Option
                                                               F1: General Help
                                                               F7: Discard Changes
                                                               F9: Load UEFI Defaults
                                                               F10: Save and Exit
                                                               ESC: Exit




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```

Boot Option #1

Use this item to set the system boot order.

Boot Option #2

Use this item to set the system boot order.

Boot Option #3

Use this item to set the system boot order.

USB Device BBS Priorities

Set the boot priorities for USB devices.

Boot From Onboard LAN

Use this item to enable or disable the Boot From Onboard LAN feature.

Setup Prompt Timeout

This shows the number of seconds to wait for setup activation key.

Bootup Num-Lock

If this item is set to [On], it will automatically activate the Numeric Lock function after boot-up.

Full Screen Logo

Use this item to enable or disable OEM Logo. The default value is [Enabled].

AddOn ROM Display

Use this option to adjust AddOn ROM Display. If you enable the option "Full Screen Logo" but you want to see the AddOn ROM information when the system boots, please select [Enabled]. Configuration options: [Enabled] and [Disabled]. The default value is [Enabled].

CSM Parameters

Use this option to configure the parameters of OpROM execution, boot options filter, etc.

Boot Option Filter

Use this option to control what devices system can boot to. Configuration options: [UEFI and Legacy], [Legacy only] and [UEFI only].

Launch Storage OpROM Policy

Select UEFI only to run those that support UEFI option ROM only. Select [Legacy only] to run those that support legacy option ROM only.

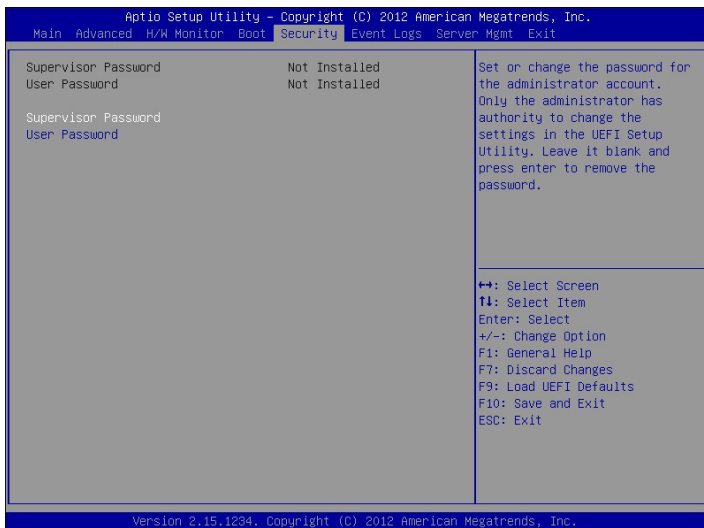## 3.6 Security Screen

In this section, you may set or change the supervisor/user password for the system. For the user password, you may also clear it.

```
                  Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
     Main  Advanced  H/W Monitor  Boot  Security  Event Logs  Server Mgmt  Exit

     Supervisor Password              Not Installed          Set or change the password for
     User Password                    Not Installed          the administrator account.
                                                             Only the administrator has
     Supervisor Password                                     authority to change the
     User Password                                           settings in the UEFI Setup
                                                             Utility. Leave it blank and
                                                             press enter to remove the
                                                             password.


                                                             ──────────────────────────────
                                                             ↔: Select Screen
                                                             ↑↓: Select Item
                                                             Enter: Select
                                                             +/-: Change Option
                                                             F1: General Help
                                                             F7: Discard Changes
                                                             F9: Load UEFI Defaults
                                                             F10: Save and Exit
                                                             ESC: Exit




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```

Supervisor Password
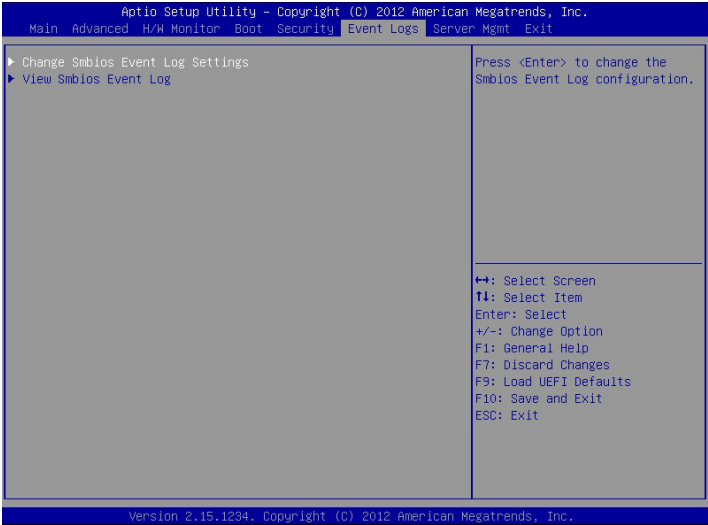
Set or change the password for the administrator account. Only the administrator has authority to change the settings in the UEFI Setup Utility. Leave it blank and press enter to remove the password.

User Password

Set or change the password for the user account. Users are unable to change the settings in the UEFI Setup Utility. Leave it blank and press enter to remove the password.

3.7 Event Logs

```
              Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
      Main   Advanced  H/W Monitor  Boot  Security  Event Logs  Server Mgmt  Exit

  ▶ Change Smbios Event Log Settings                        Press <Enter> to change the
  ▶ View Smbios Event Log                                   Smbios Event Log configuration.




                                                            ↔: Select Screen
                                                            ↑↓: Select Item
                                                            Enter: Select
                                                            +/-: Change Option
                                                            F1: General Help
                                                            F7: Discard Changes
                                                            F9: Load UEFI Defaults
                                                            F10: Save and Exit
                                                            ESC: Exit


              Version 2.15.1234. Copyright (C) 2012 American Megatrends, Inc.
```

Change Smbios Event Log Settings

This allows you to configure the Smbios Event Log Settings.

When entering the item, you will see the followings:

Smbios Event Log
Use this item to enable or disable all features of the SMBIOS Event Logging during system boot.

Erase Event Log
The options include [No], [Yes, Next reset] and [Yes, Every reset]. If Yes is selected, all logged events will be erased.

When Log is Full
Use this item to choose options for reactions to a full Smbios Event Log. The options include [Do Nothing] and [Erase Immediately].

MECI (Multiple Event Count Increment)
Use this item to enter the increment value for the multiple event counter. The valid range is from 1 to 33.

METW (Multiple Event Time Window)
Use this item to specify the number of minutes which must pass between duplicate log

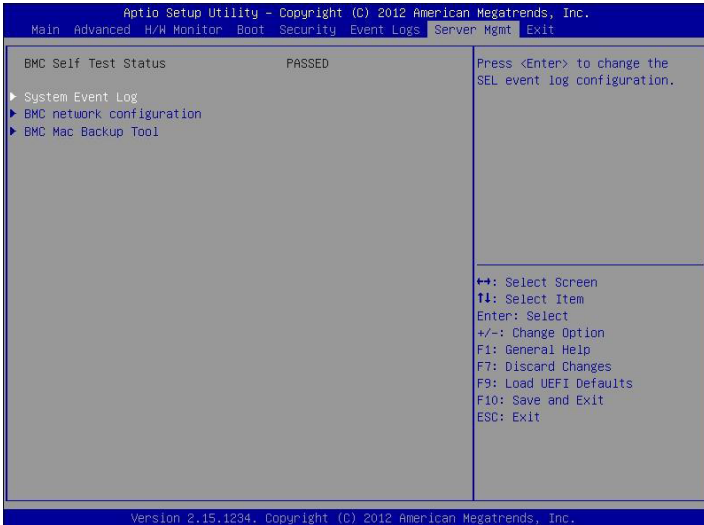entries which utilize a multiple-event counter. The value ranges from 0 to 99 minutes.

View Smbios Event Log
This allows you to view the Smbios Event Log records.

⚠️ *All values changed here do not take effect until computer is restarted.*

3.8 Server Mgmt (Server Management)

```
                  Aptio Setup Utility — Copyright (C) 2012 American Megatrends, Inc.
     Main  Advanced  H/W Monitor  Boot  Security  Event Logs  Server Mgmt  Exit

     BMC Self Test Status              PASSED              Press <Enter> to change the
                                                           SEL event log configuration.
   ▶ System Event Log
   ▶ BMC network configuration
   ▶ BMC Mac Backup Tool




                                                           ↔: Select Screen
                                                           ↑↓: Select Item
                                                           Enter: Select
                                                           +/-: Change Option
                                                           F1: General Help
                                                           F7: Discard Changes
                                                           F9: Load UEFI Defaults
                                                           F10: Save and Exit
                                                           ESC: Exit



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```

System Event Log

Enter to configure System Event Logging features during boot.

BMC Network Configuration

Enter to configure BMC Network parameters.

Configuration Address Source

Select to configure BMC network parameters statically or dynamically(by BIOS or BMC). Configuration options: [Unspecified], [Static] and [Dynamic].

Unspecified: BMC network parameters are configured by BMC itself.
Static: Manually enter the IP Address, Subnet Mask and Gateway Address in the BIOS for BMC LAN channel configuration.
Dynamic: IP address, Subnet Mask and Gateway Address are automatically assigned by the network's DHCP server.

To configure BMC network parameters using the BIOS setup, select either [Static] or [Dynamic] option.
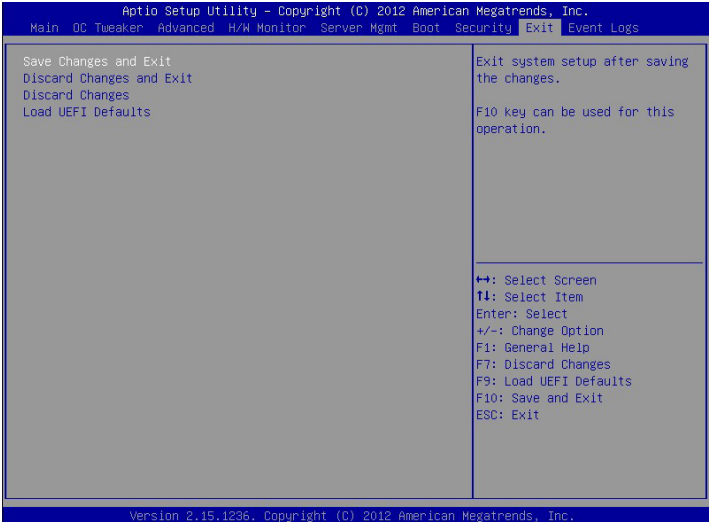To configure BMC network parameters using the BMC web interface, select [Unspecified] option.

⚠️ *When [Dynamic] or [Static] is selected, do NOT modify the BMC network settings on the IPMI web page.*

BMC Mac Backup Tool

Use this to restore BMC Mac from the backup.

3.9 Exit Screen


```
              Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
     Main   OC Tweaker   Advanced   H/W Monitor   Server Mgmt   Boot   Security   Exit   Event Logs

   Save Changes and Exit                                    Exit system setup after saving
   Discard Changes and Exit                                 the changes.
   Discard Changes
   Load UEFI Defaults                                       F10 key can be used for this
                                                            operation.




                                                            ↔: Select Screen
                                                            ↑↓: Select Item
                                                            Enter: Select
                                                            +/-: Change Option
                                                            F1: General Help
                                                            F7: Discard Changes
                                                            F9: Load UEFI Defaults
                                                            F10: Save and Exit
                                                            ESC: Exit

              Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```

Save Changes and Exit

When you select this option, the following message "Save configuration changes and exit setup?" will pop-out. Select [Yes] to save the changes and exit the UEFI SETUP UTILITY.

Discard Changes and Exit

When you select this option, the following message "Discard changes and exit setup?" will pop-out. Select [Yes] to exit the UEFI SETUP UTILITY without saving any changes.

Discard Changes

When you select this option, the following message "Discard changes?" will pop-out. Select [Yes] to discard all changes.

Load UEFI Defaults

Load UEFI default values for all the setup questions. F9 key can be used for this operation.

Chapter 4 Software Support

4.1 Install Operating System

This motherboard supports various Microsoft® Windows® Server 2003 / 2003 R2 / 2008/ 2008 R2 / Linux compliant. Because motherboard settings and hardware options vary, use the setup procedures in this chapter for general reference only. Refer to your OS documentation for more information.

4.2 Support CD Information

The Support CD that came with the motherboard contains necessary drivers and useful utilities that enhance the motherboard's features.

4.2.1 Running The Support CD

To begin using the support CD, insert the CD into your CD-ROM drive. The CD automatically displays the Main Menu if "AUTORUN" is enabled in your computer. If the Main Menu does not appear automatically, locate and double click on the file "ASRSetup. exe" from the root folder in the Support CD to display the menu.

4.2.2 Drivers Menu

The Drivers Menu shows the available device's drivers if the system detects installed devices. Please install the necessary drivers to activate the devices.

4.2.3 Utilities Menu

The Utilities Menu shows the application softwares that the motherboard supports. Click on a specific item then follow the installation wizard to install it.

4.2.4 Contact Information

If you need to contact ASRock Rack or want to know more about ASRock Rack, welcome to visit ASRock Rack's website at http://www.ASRockRack.com; or you may contact your dealer for further information.

English

Chapter 5 Troubleshooting

5.1 Troubleshooting Procedures

Follow the procedures below to troubleshoot your system.

> ⚠ *Always unplug the power cord before adding, removing or changing any hardware components. Failure to do so may cause physical injuries to you and damages to motherboard components.*

1. Disconnect the power cable and check whether the PWR LED is off.
2. Unplug all cables, connectors and remove all add-on cards from the motherboard. Make sure that the jumpers are set to default settings.
3. Confirm that there are no short circuits between the motherboard and the chassis.
4. Install a CPU and fan on the motherboard, then connect the chassis speaker and power LED.

If there is no power...
1. Confirm that there are no short circuits between the motherboard and the chassis.
2. Make sure that the jumpers are set to default settings.
3. Check the settings of the 115V/230V switch on the power supply.
4. Verify if the battery on the motherboard provides ~3VDC. Install a new battery if it does not.

If there is no video...
1. Try replugging the monitor cables and power cord.
2. Check for memory errors.

If there are memory errors...
1. Verify that the DIMM modules are properly seated in the slots.
2. Use recommended DDR3 1600/1333/1066 non ECC, unbuffered DIMMs.
3. If you have installed more than one DIMM modules, they should be identical with the same brand, speed, size and chip-type.
4. Try inserting different DIMM modules into different slots to identify faulty ones.
5. Check the settings of the 115V/230V switch on the power supply.

Unable to save system setup configurations...
1. Verify if the battery on the motherboard provides ~3VDC. Install a new battery if it does not.

2. Confirm whether your power supply provides adaquate and stable power.

Other problem...

1. Try searching keywords related to your problem on ASRock Rack's FAQ page:
   http://www.asrockrack.com/support

5.2 Technical Support Procedures

If you have tried the troubleshooting procedures mentioned above and the problems are still unsolved, please contact ASRock Rack's technical support with the following information:

1. Your contact information
2. Model name, BIOS version and problem type.
3. System configuration.
4. Problem description.

You may contact ASRock Rack's technical support at:
http://www.asrockrack.com/support/tsd.asp

5.3 Returning Merchandise for Service

For warranty service, the receipt or a copy of your invoice marked with the date of purchase is required. By calling your vendor or going to our RMA website (http://www.asrock.com/support/index.asp?cat=RMA) you may obtain a Returned Merchandise Authorization (RMA) number.
The RMA number should be displayed on the outside of the shipping carton which is mailed prepaid or hand-carried when you return the motherboard to the manufacturer. Shipping and handling charges will be applied for all orders that must be mailed when service is complete.

This warranty does not cover damages incurred in shipping or from failure due to alteration, misuse, abuse or improper maintenance of products.

Contact your distributor first for any product related problems during the warranty period.